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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,676

06/19/2006

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10429.204-US

6515

25908 7590 12/30/2008
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EXAMINER

ARIANI, KADE

ART UNIT

PAPER NUMBER

1651

MAIL DATE

DELIVERY MODE

12/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,676	Applicant(s) FESTERSEN ET AL.	
	Examiner KADE ARIANI	Art Unit 1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28 and 31-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28, and 31-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/02/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment filed on September 02, 2008, has been received and entered. Claims 29 and 30 have been cancelled. New Claims 48-50 have been added. Claims 28 and 31-50 are pending in this application and were examined on their merits.

Applicant's arguments with respect to claims 28 and 30-50 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

The objection to Claims 28-50 and 42-45 is withdrawn due to Applicants amendment to the claims filed on 09/02/2008.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The rejection of Claims 28, 30, 31, 32, 34, 36-39, 46, 49, and 50 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and

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distinctly claim the subject matter which applicant regards as the invention, is withdrawn due to Applicants amendment to the claims filed on 09/02/2008.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The rejection of Claims 28-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laroye (EP 0910620B1) in view of Henrissat & Davies (Current Opinion in structural Biology, 1997, Vol.7, p.637-644) and further in view of Schülein M. (Journal of Bacteriology, 1997, Vol. 57, p.71-81), and further in view of Kofod et al. (US Patent No. 6,197,564), and further in view of Bower et al. (WO 99/31255), and further in view of Sandal et al. (WO 9727292-A1), and further in view of Lund et al. (WO 97/18286) is withdrawn due to Applicant's amendments to the claims filed on 09/02/2008.

Claims 28 and 31-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laroye (EP 0910620B1) in view of Bedford et al. (US Patent No. 6,562,340 B1) and further in view of Kofod et al. (US Patent No. 6,197,564).

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Claims 28, 31-40 are drawn to a process for production of a mash having enhanced filterability (and/or improved extract yield after filtration), which comprises; preparing a mash in the presence of enzyme and filtering the mash to obtain a wort, wherein the enzyme comprise; a) a xylanase of glucoside hydrolase (GH) family 10 present in an amount of at least 15% w/w, and endoglucanase enzyme protein, and b an endoglucanase enzyme protein of a GH family selected from the group consisting of GH12, GH7, and GH5 and present in an amount of at least 49% w/w of the total xylanase and endoglucanase enzyme protein, wherein the xylanase of GH family 10 is present in an amount of at least 20% w/w of the xylanase and endoglucanase enzyme protein, wherein the endoglucanase of family GH12, GH7, and GH5 is present in an amount of at least 45% w/w of the total xylanase and endoglucanase enzyme protein, wherein the xylanase is a type A xylanase.

Claim 41-43 are drawn to a process of reducing the viscosity of an aqueous solution comprising a starch hydrolysate, said process comprising, testing at least one xylanolytic enzyme for its hydrolytic activity towards insoluble wheat arabinoxylan, selecting a xylanolytic enzyme, adding the xylanolytic enzyme to the aqueous solution comprising a starch hydrolysate, and testing at least one endoglucanolytic enzyme for its hydrolytic activity towards barley beta-glucan, selecting an endoglucanolytic enzyme (under conditions), adding the selected endoglucanolytic enzyme to the aqueous solution comprising a starch hydrolysate.

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Claims 44-48 are drawn a composition comprising a GH10 xylanase present in an amount of at least 15% w/w of the total enzyme protein, the xylanase is type A xylanase, derived from a filamentous fungi, xylanase derived from a bacillus.

Claims 49 and 50 are drawn to a process for production of a mash having enhanced filterability and/or improved extract yield after filtration, which comprises, preparing a mash in the presence of enzyme activities and filtering the mash to obtain wort, wherein the enzyme comprise; a) a xylanase of glucoside hydrolase (GH) family 10 present in an amount of at least 15% w/w, and endoglucanase from *Trichoderma* sp., and endoglucanase consisting of SEQ ID No.18.

Laroye teaches a process for production of a mash having enhanced filterability, preparing a mash in the presence of a mixture of enzyme activities, and filtering the mash to obtain a wort, the enzyme is a xylanase, and a composition comprising mixture of enzymes, a composition comprising at least β -glucanase activity, endo-xylanase activity, preferably 1,4- β -endoxylanase activity, and a mixture of β -glucanase and endo-xylanase (pages 3 0009 continued, and 0013, 0015, and p. 0024), xylanase was obtained from *Aspergillus niger* (page 4 0028), endoglucanase or β -glucanase from *Bacillus amyloliquefaciens* (p.4 0027). Laroye teaches for brewing beer grains and or malted grains are liquefied and saccharified in order to yield fermentable sugars, after filtration of the liquefied and saccharified mash, the obtained wort is inoculated with special strains of yeast, which convert sugars into ethanol and characteristic flavor. However, apart from starch other polysaccharides are present in cereal grains (page 2 0002 and 0003). Laroye teaches enzymes that may be used are cellulases, β -

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glucanases, and other plant cell wall degrading enzymes (page 3 0018), Laroye further teaches several microbial enzymes may be used (page 4 0022 and 0025). Laroye further teaches β -glucans are highly viscous and bring wort and beer filtration problems if they are not hydrolyzed during the liquefaction step (page 2 0004). Laroye also teaches a need for methods of preparing wort with further improved filterability and increased yield (page 2 0008), the need for a faster process, less clogging of filters, and larger wort volumes. Laroye teaches the improved yield leads to a more economic brewing process (page 4 0026). Laroye further teaches varying composition of the enzymes mixture were carried out in order to determine the role of each component of the mixture with regards to yield and filtration improvement, 90 Units/Kg β -glucanase, 1200 Units/Kg xylanase (p.7 0041, 0042, p.8 lines 1-10, Table, p.9 0051 Table). Laroye also teaches a process of reducing the viscosity of an aqueous solution comprising a starch hydrolysate, said process comprising, testing at least one xylanolytic enzyme for its hydrolytic activity by hydrolysis of xylan from oat spelts (page 4 0028).

Laroye does not teach a xylanase of glucoside hydrolase (GH) family 10 present and endoglucanase enzyme protein of GH family. However, Bedford et al. teach an endoglucanase (SEQ ID No. 18) from *Trichoderma reesei* and *Trichoderma viride* (column 3 lines) with β -glucanase activity (column 19 lines 5-8). Bedford et al. further each endoglucanase has its own characteristics. EGI in addition to cellulase activity is known to hydrolyze xylan. EG II and EGIII by comparison do not show significant xylanase activity (column 2 lines 18-21). Bedford et al. also teach several different cellulases having an enriched content of endoglucanases in comparison with whole

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cellulose, some strains have multiple copies (column 2 1 lines 43-45 and 62-65).

Bedford et al. teach the actual concentrations of a specific cellulase component will vary according to numerous factors, including fermentation conditions, substrate concentrations and strain type (column 2 lines 11-16). Accordingly, a person of ordinary skill in the art at the time the invention was made would have known that different enzyme preparations showing different levels of xylanase and endoglucanase activity could have been prepared.

Moreover, Kofod et al. teach a xylanase derived from *Aspergillus aculeatus* (SEQ ID No.9), a xylanase of glucoside (GH) family 10, an endo-xylanase activity (column 16 lines 64-65). Kofod et al. further teach the xylanase in addition to xylanase activity exhibits α -arabinio-pyranosidase activity (column 5 lines 14-15). Kofod et al. also teach surprisingly it has been found that the xylanase II of the present invention may be used to improve the filterability of wort (column 8 lines 64-65).

Therefore, in view of the above teachings, a person of ordinary skill in the art at the time the invention was made could have been motivated to substitute the endo-xylanase and endoglucanase enzymes in the composition and method as taught by Laroye with the endo-xylanase of Kofod et al. and/or endoglucanase as taught by Bedford et al. in order to provide a process for production of a mash having enhanced filterability with the predictable result of hydrolysing the β -glucans in the mash, reducing the viscosity, and less clogging of filters. The claim method and composition would have been obvious because a person of ordinary skill in the art at the time the invention was made could have been motivated to use known enzymes or enzyme preparations which

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were taught in the prior art for their effect on reducing viscosity in a known mashing process, and the results would have been predictable to one of ordinary skill in the art.

Conclusion

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on (571) 272-0926. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kade Ariani
Examiner
Art Unit 1651

/Leon B Lankford/
Primary Examiner, Art Unit 1651